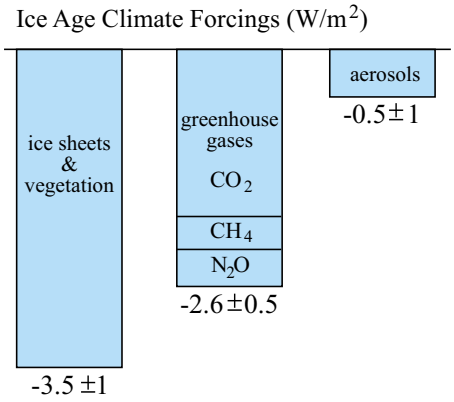

Figure 1. Climate forcing during the Ice Age 20,000 years ago relative to the current interglacial period. This forcing of -6.6 ±1.5 W/m^2 and the 5°C cooling of the Ice Age imply a climate sensitivity of 0.75°C per 1 W/m^2.

Forcing ~ 6.6 ± 1.5 W/m²
Observed ΔT ~ 5 °C
→ ¾ °C per W/m²

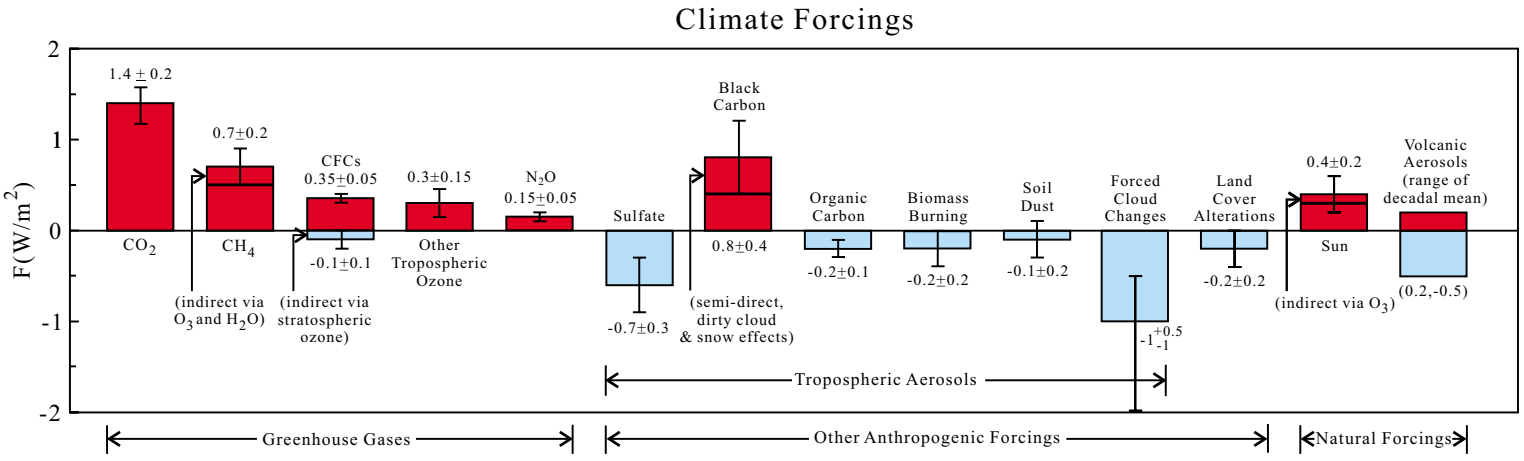

Figure 2. Estimated change of climate forcings between 1850 and 2000, based on (1) with five principal aerosols delineated.

Sum ~1.7 W/m²
Sensitivity ¾ °C per W/m² → 1.2-1.3 °C warming at equilibrium
Today: ¾ °C warming + 0.7 W/m² remaining imbalance

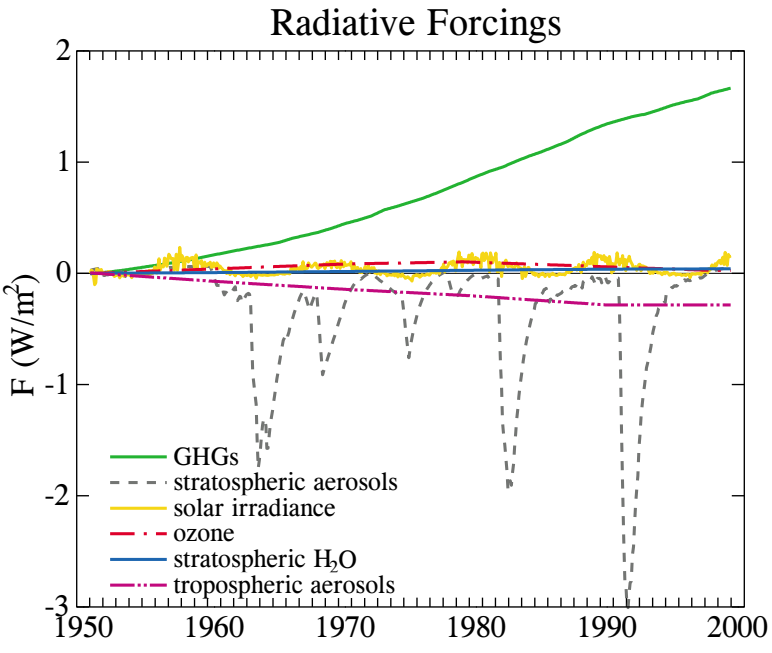

Figure 3. Climate forcings in the past 50 years, relative to 1950, due to six mechanisms (6). The first five forcings are based mainly on observations, with stratospheric H_2O including only the source due to CH_4 oxidation. GHGs include the well-mixed greenhouse gases, but not O_3 and H_2O. The tropospheric aerosol forcing is uncertain in both its magnitude and time dependence.

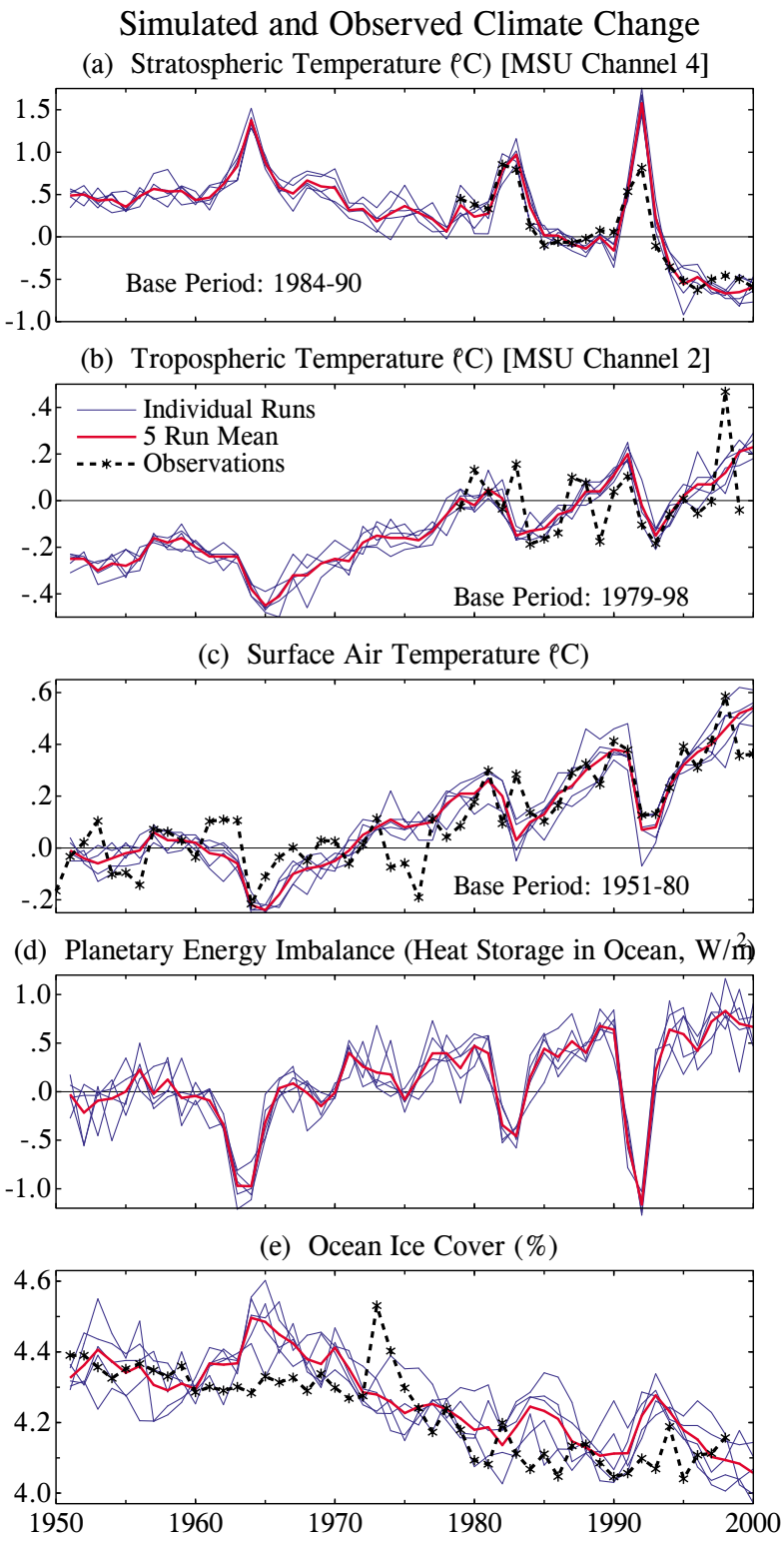

Figure 4. Simulated and observed climate change for 1950-2000 (6). These simulations with GISS climate model (3) employ empirical mixing rates and fixed horizontal heat transports in the ocean (5). Climate forcings are those of Figure 3.

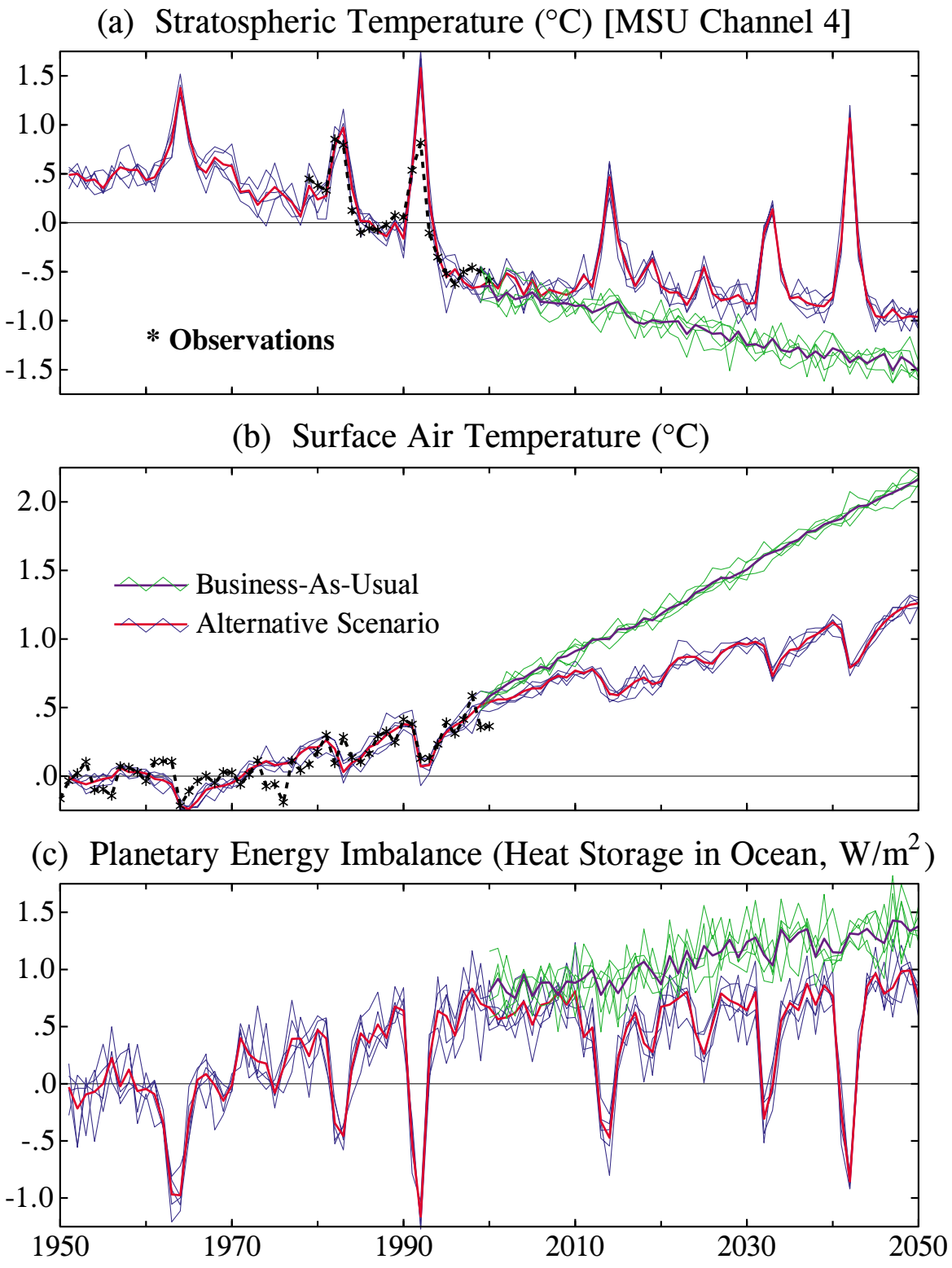

Figure 5. Simulated temperatures and planetary energy imbalance for the forcings in Figure 3 (6). The business-as-usual (1% CO_2/year) adds 2.9 W/m^2 forcing in 2001-2050. The alternative scenario adds a greenhouse gas forcing of 1.1 W/m^2 in that period and includes volcanoes similar to those during 1951-2000.

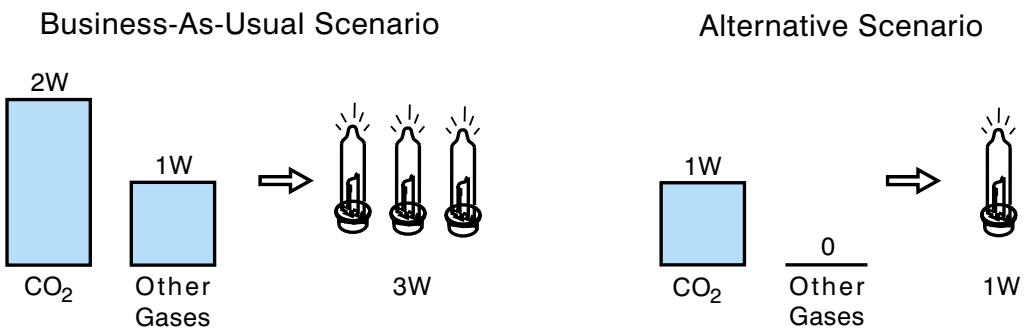

Figure 6. Cartoon depicting approximate added climate forcings between in an extreme "business-as-usual" scenario and the "alternative" scenario.

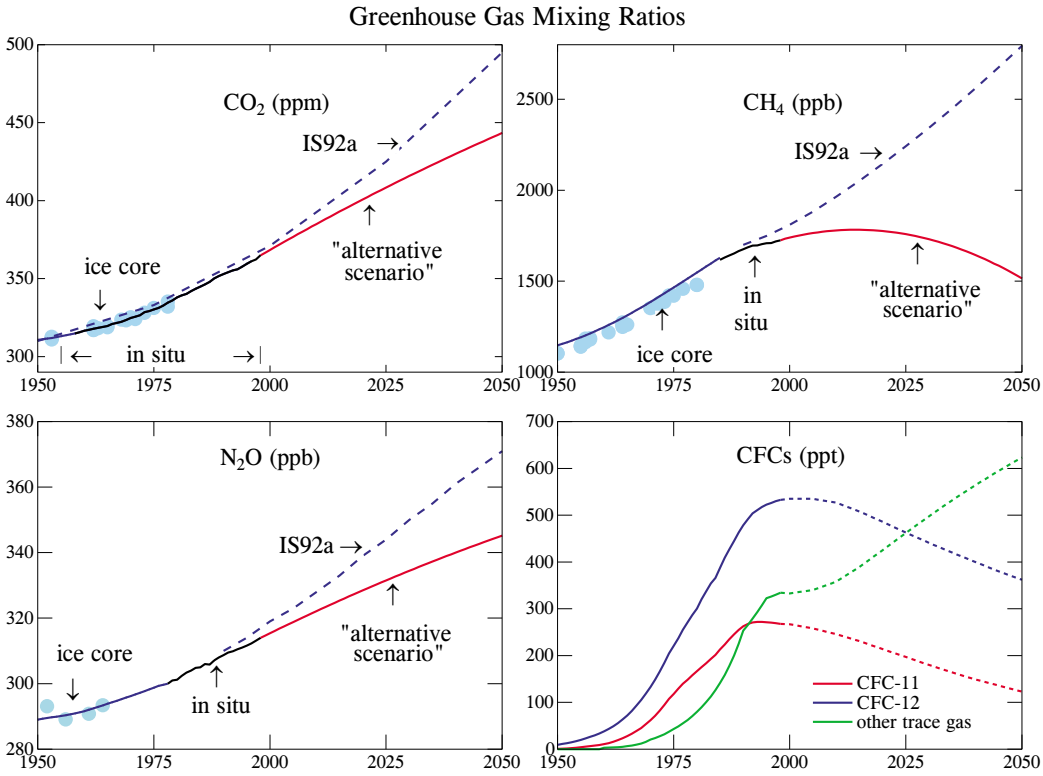

Figure 7. Measured greenhouse gas amounts and "alternative scenario" extensions to 2050. IS92a scenarios of IPCC (2) for CO_2, CH_4 and N_2O are illustrated for comparison. The sum of CFC and "other trace gas" forcings is constant after 2000 in the alternative scenario.

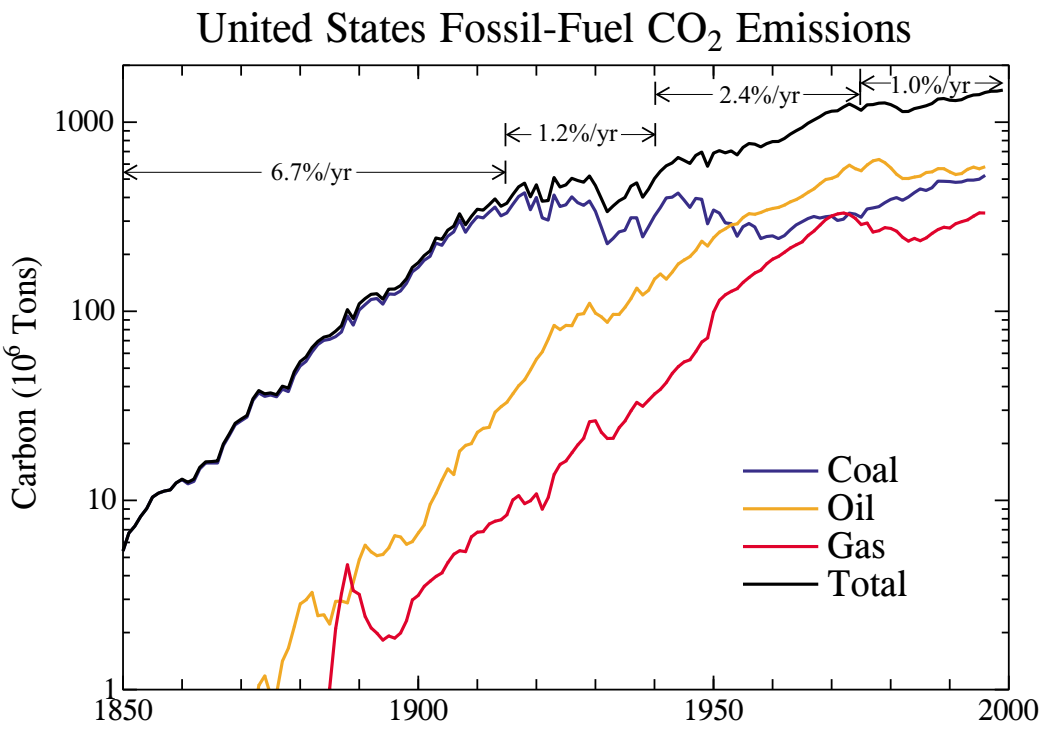

Figure 8. Annual emissions of CO_2 from fossil fuels in the United States (principal data source: Oak Ridge National Laboratory, Department of Energy)

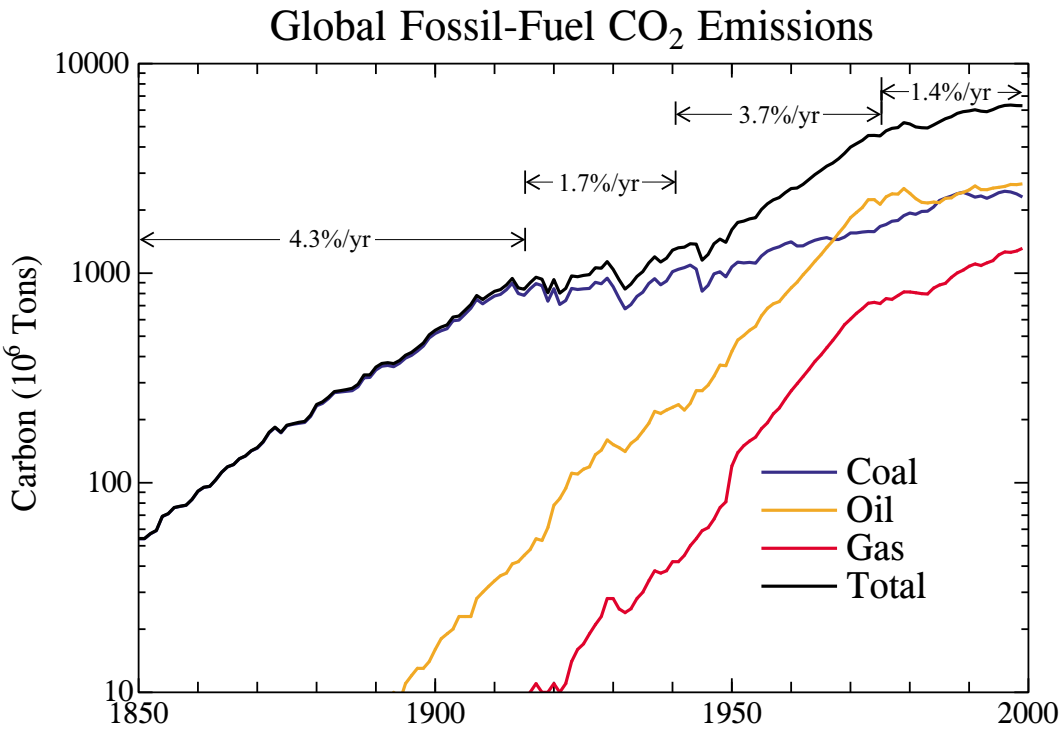

Figure 9. Annual emissions of CO_2 from fossil fuels in the world (principal data source: Oak Ridge National Laboratory, Department of Energy)

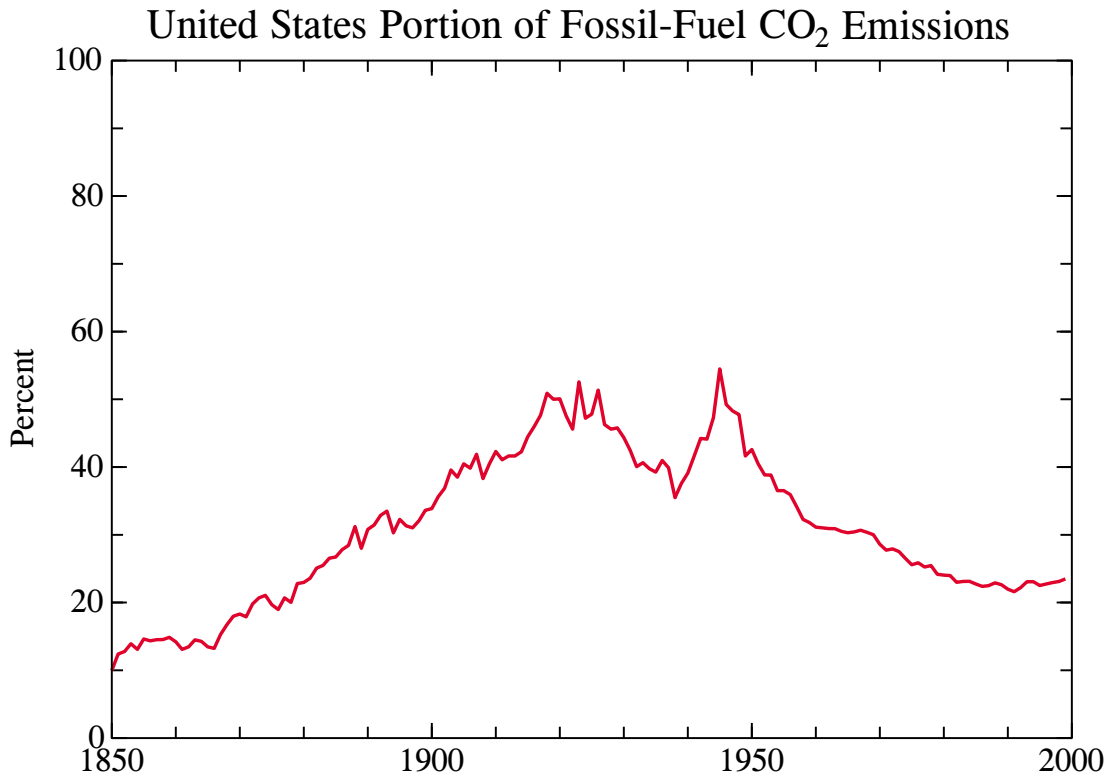

Figure 10. Percentage of world fossil-fuel CO_2 emissions produced in the United States.

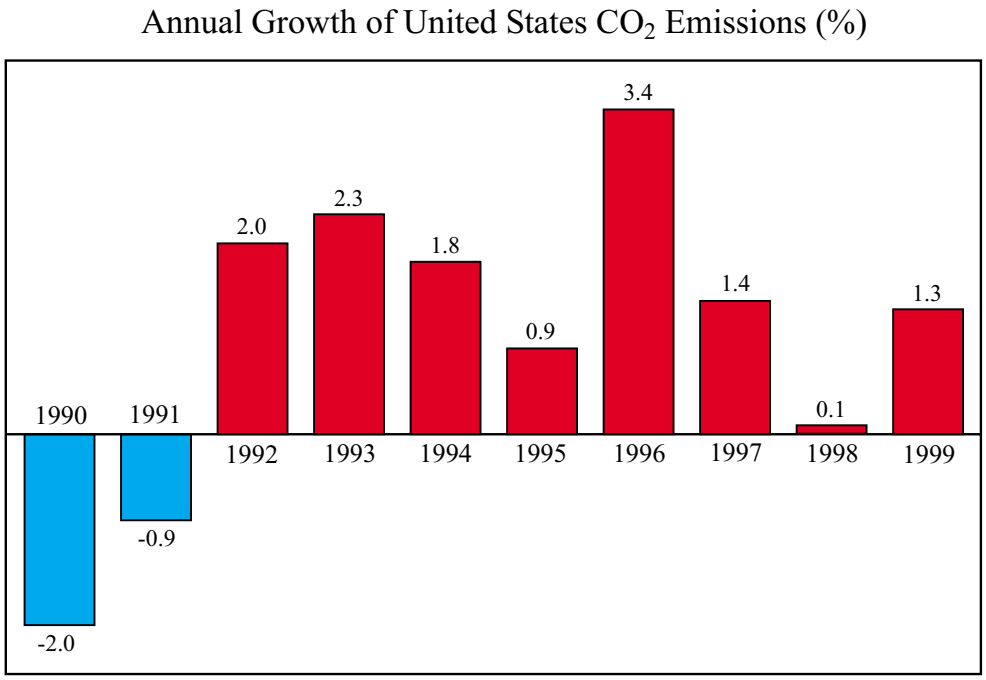

Figure 11. Annual change of United States fossil-fuel CO_2 emissions.